WHAT IS CLAIMED IS:

1. A filter guidewire for capturing embolic material generated during treatment of a lesion in vessels of a patient, the guidewire comprising:

an elongate core wire having a proximal end and a tapered distal end;

a flexible tubular tip member fixed adjacent the core wire distal end;

an elongate tubular shaft slidably disposed along the core wire, the shaft including an elongate proximal portion and a relatively short distal portion, the distal portion being more flexible than the proximal portion and being disposed proximally of the tip member;

a transition sleeve fixed about the core wire, the sleeve being slidably disposed within the shaft distal portion and extending distally therefrom; and

a generally tubular filter mounted coaxially about the core wire, the filter having a tapered distal end fixed to the tip member and a tapered proximal end fixed to the shaft distal portion, wherein relative displacement of the filter ends associated with longitudinal displacement between the tubular shaft and the core wire causes transformation of the filter between a collapsed configuration and a deployed configuration.

2. The filter guidewire of claim 1 wherein the tubular shaft proximal portion comprises metal tubing.

3. The filter guidewire of claim 1 wherein the tubular shaft distal portion comprises polymeric tubing.

4. The filter guidewire of claim 1 wherein the transition sleeve comprises polymeric tubing.

5. The filter guidewire of claim 3 wherein the polymeric tubing comprises polyimide.

6. The filter guidewire of claim 4 wherein the polymeric tubing comprises polyimide.

7. A temporary filter guidewire comprising:

an elongate flexible guidewire wire having a proximal end and a flexible tubular element fixed about a guidewire distal region;

a generally tubular, self-expanding filter mounted coaxially about the guidewire, the filter having distal and proximal tapered ends slidingly disposed about the guidewire distal region, wherein relative separation of the filter ends causes transformation of the filter from a deployed configuration to a collapsed configuration;

a stop element fixed to the guidewire between the filter distal and proximal ends, the stop element obstructing movement of the filter distal and proximal ends along the guidewire;

a tubular actuator fixed to the filter proximal end and extending proximally adjacent thereto, the tubular actuator slidably disposed along the guidewire; and

an elongate hollow rod slidably and removably disposed about the guidewire and having a rod distal end releasably engageable with the tubular actuator the hollow rod being operable, when the rod distal end is so engaged and in response to applying a first degree of proximally directed force to the hollow rod, to withdraw the filter until the filter distal end contacts the stop element and to further withdraw the filter proximal end to separate the filter distal and proximal ends, to cause the filter to transform from the deployed configuration to the collapsed configuration.

8. The temporary filter guidewire of claim 7 wherein the hollow rod is further operable, in response to applying a second, higher degree of proximally directed force to the rod, to disengage the hollow rod from the tubular actuator, such that the hollow rod can be removed from the guidewire and the filter can be free to expand itself.

9. The temporary filter guidewire of claim 7 wherein the hollow rod is operable to engage the rod distal end with the tubular actuator by compression of the tubular actuator between the rod distal end and the stop element.

10. The temporary filter guidewire of claim 9 wherein compression of the tubular actuator between the rod distal end and the stop element causes frictional engagement between the rod distal end and a tapered proximal end of the tubular actuator.

11. The temporary filter guidewire of claim 7 wherein the stop element comprises a tube.

12. The temporary filter guidewire of claim 7 wherein the stop element comprises a coiled spring having at least one turn fixed to the guidewire.

13. The temporary filter guidewire of claim 11 further comprising a coiled tension spring mounted about the stop element and the guidewire, the spring having distal and proximal ends fixed to the filter distal and proximal ends, respectively.

14. The temporary filter guidewire of claim 7 wherein the hollow rod comprises an elongate, wire-like proximal shaft and a relatively short tubular distal section.

15. The temporary filter guidewire of claim 7 wherein the self-expanding filter comprises braided multiple filaments.

16. The temporary filter guidewire of claim 15 wherein at least one of the braided filaments comprises a radiopaque material.

17. The temporary filter guidewire of claim 15 wherein at least one of the braided filaments comprises a wire having an inner core of a first material surrounded by an outer layer of a second material.

18. The temporary filter guidewire of claim 17 wherein one of the first and second materials is radiopaque and the other of the first and second materials is relatively non-radiopaque.

19. The temporary filter guidewire of claim 18 wherein the wire is formed by a drawn-filled-tube process.

20. The temporary filter guidewire of claim 19 wherein the first material is an alloy comprising 90% platinum and 10% nickel, and wherein the second material is nitinol.

21. A temporary filter device comprising:

an elongate flexible guidewire having a proximal end and a flexible tubular element fixed about a guidewire distal region;

a generally tubular filter mounted coaxially about the guidewire, the filter having a tapered distal end slidingly disposed about the guidewire distal region and a tapered proximal end fixed about the guidewire, the filter including an opening near the filter proximal end, wherein relative longitudinal movement between the filter ends accompanies transformation of the filter between a collapsed configuration and a deployed configuration;

a tubular actuator slidably disposed along the guidewire, the actuator including a proximal end and a distal end disposed proximally of the filter; and

a link slidably disposed through the opening and connecting the actuator distal end to the filter distal end.

22. The temporary filter device of claim 21 wherein the proximal end of the filter is fixed about the guidewire by a joint having the opening therethrough.

23. The temporary filter device of claim 21 wherein the link includes a tubular distal segment slidably disposed along the guidewire, the distal segment being disposed within the filter.

24. The temporary filter device of claim 21 wherein the tubular actuator is an elongate tube.

25. The temporary filter device of claim 21 wherein the tubular actuator is a relatively short tube or ring.

26. The temporary filter device of claim 25 further comprising an elongate hollow rod slidably and removably disposed along the guidewire, the rod having a distal end engageable with the tubular actuator.

27. The temporary filter device of claim 26 further comprising a stop element fixed to the guidewire proximal to the tubular actuator, the stop element having a transverse dimension smaller than a transverse dimension of the tubular actuator such that the stop element is operable to permit the hollow rod to slide there over while being capable of preventing a catheter slidably mounted on the guidewire from engaging the tubular actuator.

28. The temporary filter device of claim 26 wherein the hollow rod comprises an elongate, wire-like proximal shaft and a relatively short tubular distal section.

29. The temporary filter device of claim 26 wherein the elongate hollow rod further comprises an interventional catheter.

30. A temporary filter device comprising:

an elongate flexible guidewire having a proximal end and a flexible tubular element fixed about a guidewire distal region;

a braided tubular filter mounted coaxially about the guidewire, the filter having a tapered distal end slidingly disposed about the guidewire distal region and a tapered proximal end fixed about the guidewire, the filter including an opening near the filter proximal end, wherein relative longitudinal movement between the filter ends accompanies transformation of the filter between a collapsed configuration and a deployed configuration;

a tubular actuator slidably disposed along the guidewire, the actuator including a proximal end and a distal end disposed proximally of the filter; and

a link slidably disposed through the opening and connecting the actuator distal end to the filter distal end.

31. The temporary filter device of claim 30 further comprising a coiled compression spring disposed around the guidewire between and abutting the filter proximal end and the actuator distal end to assist in transformation of the filter to the deployed configuration.

32. The temporary filter device of claim 30 further comprising a coiled tension spring disposed around the guidewire, the tension spring attached between the filter proximal and distal ends to assist in transformation of the filter to the deployed configuration.

33. The temporary filter device of claim 30 further comprising a coiled compression spring disposed around the guidewire, the compression spring having a spring distal end fixed to the guidewire about the guidewire distal region and a spring proximal end abutting the filter distal end to assist in transformation of the filter to the deployed configuration.

34. The temporary filter device of claim 30 further comprising a coiled tension spring disposed around the guidewire, the tension spring attached between the filter proximal end and the actuator distal end to assist in transformation of the filter to the collapsed configuration.

35. The temporary filter device of claim 30 further comprising a coiled compression spring disposed around the guidewire between and abutting the filter proximal and distal ends to assist in transformation of the filter to the collapsed configuration.

36. The temporary filter device of claim 30 further comprising a coiled tension spring disposed around the guidewire, the tension spring having a spring distal end fixed to the guidewire about the guidewire distal region and a spring proximal end fixed to the filter distal end to assist in transformation of the filter to the collapsed configuration.

37. A temporary filter device comprising:

an elongate flexible guidewire having a proximal end, a distal end, and a flexible tubular element fixed about a guidewire distal region;

a generally tubular filter mounted coaxially about the guidewire, the filter having a tapered distal end slidingly disposed near the distal end of the guidewire and a tapered proximal end fixed to the guidewire, the filter including an opening adjacent the filter proximal end;

an actuator mechanism slidably disposed about the guidewire and extending slidably through the opening to connect with the filter distal end, wherein proximal displacement of the guidewire relative to the actuator mechanism separates the filter proximal and distal ends, causing transformation of the filter from a deployed configuration to a collapsed configuration.

38. A temporary filter system comprising:

an elongate flexible guidewire having a proximal end, a distal end, and a flexible tubular element fixed about a guidewire distal region;

a generally tubular, self-deploying filter mounted coaxially about the guidewire, the filter having a tapered distal end slidingly disposed near the distal end of the guidewire and a tapered proximal end fixed to the guidewire, the filter including an opening adjacent the filter proximal end, wherein relative displacement between the filter ends causes transformation of the filter between a collapsed configuration and a deployed configuration;

an actuator ring slidably disposed along the guidewire proximally of the filter;

a link slidably disposed through the opening and connecting the actuator ring to the filter distal end; and

an interventional catheter slidably disposed along the guidewire, the catheter having a distal end capable of engaging with and displacing the actuator ring, causing transformation of the filter from a deployed configuration to a collapsed configuration

39. A temporary intraluminal filter having a generally cylindrical body with tapered ends, the filter comprising a tube formed by braided filaments that define pores, the filter having at least one inlet opening that is substantially larger than the pores, wherein relative longitudinal movement between the filter ends accompanies transformation of the filter between a collapsed configuration and a deployed configuration, and wherein at least one of the braided filaments comprises a radiopaque material.

40. The filter of claim 39 wherein the at least one of the braided filaments comprising a radiopaque material is a wire having an inner core of a first material surrounded by an outer layer of a second material, and wherein one of the first and second materials is radiopaque and the other of the first and second materials is relatively non-radiopaque.

41. The filter guidewire of claim 40 wherein the wire is formed by a drawn-filled-tube process.

42. The filter guidewire of claim 40 wherein the first material is an alloy comprising 90% platinum and 10% nickel, and wherein the second material is nitinol.

43. A method of capturing embolic material generated during a vascular intervention at a treatment site within a patient, the method including the steps of:

providing a filter guidewire including a guidewire and a self-expanding filter assembly having a tapered filter distal end slidingly disposed adjacent a guidewire distal end and a tapered filter proximal end fixed to the guidewire, the filter guidewire further including an actuator mechanism slidably disposed along the guidewire proximal to the filter and connected to the filter distal end;

collapsing the filter assembly by advancing a hollow rod distally along the guidewire until the rod engages with and distally displaces the actuator mechanism;

introducing the filter guidewire into and through the patient's vasculature until the filter assembly is located downstream of the treatment site;

allowing the filter assembly to expand by withdrawing the rod from engagement with the actuator mechanism and removing the rod from the patient;

advancing a treatment catheter over the guidewire to position the catheter within the treatment site;

performing the vascular intervention with the treatment catheter and capturing embolic material that may be generated thereby;

collapsing the filter assembly by advancing the treatment catheter distally along the filter guidewire until the catheter engages with and distally displaces the actuator mechanism;

withdrawing the filter guidewire and the catheter together while maintaining distal displacement of the actuator mechanism.

44. A method of capturing embolic material generated during a vascular intervention at a treatment site within a patient, the method including the steps of:

providing a filter guidewire including a guidewire and a self-expanding filter assembly having filter distal and proximal tapered ends slidingly disposed adjacent a guidewire distal end, the filter guidewire further including an actuator slidably mounted about the guidewire and fixed to the filter proximal end, and a stop element fixed to the guidewire between the filter distal and proximal ends;

engaging a rod distal end with the actuator by compressing the actuator between an elongate hollow rod and the stop element;

collapsing the filter assembly by applying a first degree of proximally directed force to the rod and simultaneously applying an equal degree of distally directed force to the guidewire;

introducing the filter guidewire into and through the patient's vasculature until the filter assembly is located downstream of the treatment site;

permitting self-expansion of the filter and removal of the rod from the filter guidewire by applying a second, higher degree of proximally directed force to the rod and simultaneously applying an equal degree of distally directed force to the guidewire to disengage the rod from the actuator;

advancing a treatment catheter over the guidewire to position the catheter within the treatment site;

performing the vascular intervention with the treatment catheter;

engaging the actuator with a distal end of the catheter by compressing the actuator between the treatment catheter and the stop element;

collapsing the filter assembly by applying the first degree of proximally directed force to the catheter and simultaneously applying an equal degree of distally directed force to the guidewire;

withdrawing the filter guidewire and catheter together from the patient.